310.151

REPORT

of

WESTERN PINE BEETLE SURVEY

KLAMATH INDIAN RESERVATION.

August 1926.

THE SURVEY.

During the period August 16th to 26th the Bureau of Entomology conducted a beetle survey of a portion of the Klamath Indian Reservation where there are valuable timber resources, and where epidemic western pine beetle infestations were known to be causing great damage. This survey was made under the personal supervision of the writer who was assisted by Mr. W. J. Buckhorn.

The area surveyed may be roughly described as that part of the Reservation lying north of the Sprague River, which is bounded on the east by the Sycan Marsh and on the west by the Applegate Buttes and the Klamath Marsh. The extent of the area surveyed comprises approximately 610 square miles. It includes within its borders the best timber resources of the Klamath Reservation.

This survey was made with the object of securing data upon which to base a reliable estimate of the annual losses sustained and to make it possible for the Bureau of Entomology to advise the Indian Service concerning control measures in the event such operations are undertaken.

METHODS USED.

The methods which were used in conducting this survey are those generally practiced by the Bureau of Entomology in making preliminary estimates of insect infestations in regions where no previous extensive examinations have been made. In brief this survey consisted of examining all trees killed by beetles in 1925 and 1926, in a few representative sections; running strip surveys from 5 to 10 chains wide and from 1 to 3 miles long on compass lines thru the infested stands; and by counting all beetle killed trees within a strip 5 chains wide on each side of all roads traversed. These surveys supplemented by a general reconnaissance of the country mapped resulted in securing the data incorporated in this report.

DATA SECURED.

The estimates of beetle losses and of the intensity of the infestations given herewith are based mainly on the number of yellow pine trees killed in 1925 by the western pine beetle. However, the current year's infestation, represented by trees attacked since April 1926, has been considered and a partial estimate of the 1926 is also given.

The 1925 losses are taken as a basis for the estimates because all the trees killed in that year have faded and it was possible to definitely determine their number at the time the survey was made. A large part of the trees which have been attacked during the current year are still green and only an examination of their bark reveal their presence. However, enough data on the 1926 infestation were secured to indicate that the total 1926 loss will exceed that of 1925 by 25%.

INSECT RESPONSIBLE FOR LOSSES.

The present losses in the stands surveyed are due almost entirely to the western pine beetle, Dendroctonus brevicomis. Other barkbeetles, such as the mountain pine beetle, Dendroctonus monticolae, and the engraver beetles, Ips spp. are present but the infestation consists primarily of D. brevicomis. Flathead borers are responsible for the loss of a negligible quantity of the killed trees.

The infestation is confined almost entirely to the western yellow pine. Very few sugar pines and lodgepole pine have been attacked.

AMOUNT OF BEETLE LOSS.

The intensity of the infestation varies with site, soil conditions, and type of stand. The heaviest beetle losses are occurring on the drier south exposures where the stands consist almost wholly of yellow pine of comparatively low grade. On such sites the 1925 loss averaged well over 200 trees per section. The stands suffering the losses next in intensity, averaging between 100 and 200 trees per section, are found bordering the above areas but where soil conditions favor a more vigorous growth. In general these infestations are found at lower elevations and on northern exposures. The minimum loss on the area, averaging less than 30 trees per section, is found at low elevations where the stand is vigorous and where the type contains a relatively high percentage of lodgepole pine. A loss of this amount is typical of normal infestations of the western pine beetle.

A striking pecularity of these infestations was noted. A relatively high beetle infestation occurs in all stands regardless of type or site where the pine moth Coloradia pandora had defoliated the trees during its epidemic of 1918 to 1925.

The total 1925 infestation on the area surveyed, exclusive of the Long-Bell tract, is estimated at 83,000 trees. The 1926 loss will exceed this total by about 25% and will amount to approximately 100,000 trees.

THE MAP.

The attached map shows in colors the area surveyed, the different colors representing the varying degrees of intensity of the infestations which are described above. The surveyed area has been divided on the map into 8 sub-areas or infestation units. The division in units has been determined by the topography of the area rather than by any striking difference in infestation. However, in blocking them out the boundaries have been drawn as far as possible to isolate each infested area from the others.

The 8 units created, including their area and the estimated beetle infestation on each, are as follows:

Unit.	Area in secs.	Beetle killed trees 1925.
A - Long Creek.....	57	 2,650
B - Torrent Spring	42	 6,150
C - Black Hills	115	 20,500
D - Calimus	155	 28,750
E - Taylor Butte	95	 6,650
F - Applegate	25	 2,150
G - Weeks Bay	95	 11,650
H - Yamsay	46	 4,500
	610	83,000

Reference to the map will show the varied intensity of these infestations. The highest infestation is shown in red and occurs throughout the Black Hills, along the south slopes of Fuego Mt. and Calimus Butte, and along the south boundary of the Long-Bell Tract. The next highest, shown in orange, occurs generally throughout the entire area and is not confined to restricted localities.

The infestations on the Long-Bell Tract, a privately owned area, have been of approximately the same intensity as those surrounding it. The owners of this tract have practiced control of these infestations for the past two years and have been successful in greatly reducing the annual losses where there has not been encroachment of beetles from bordering untreated stands. The areas treated on this tract during the past season are shown on the map in red hatchure. The number of infested trees treated on these areas during the fall of 1925 and the spring of 1926 averaged 62 trees per section.

SUGGESTIONS FOR CONTROL OPERATIONS.

No more intensive western pine beetle infestations have ever come to the attention of the Bureau of Entomology than those now existing on that part of the Reservation covered by this survey.

Millions of feet of valuable timber are being destroyed annually. On some areas in the Black Hills the combined losses of the past five years have amounted to 25% of the merchantible stands.

These high losses may be materially reduced by the application of control measures which have proven successful on other control projects. Owing to the large territory covered and the intensity of the infestations an attempt to control the entire infested area in one operation would require an immediate expenditure of a very large fund. It would be highly desirable to cover the entire area at once if sufficient funds could be secured. However, the topography of the area and the comparative isolation of the centers of infestation in the northern part make it possible to inaugurate a series of small control operations which would secure protection of the timber of these areas with an expenditure of moderate sums. Later control operations could be extended into other units eventually covering the entire infested area.

The northern units, where control operations under this plan should be first established, are as follows:

Long Creek. Area 37 sections. The 1925 infestation amounted to 2,650 trees. The infestation on this unit is well isolated on the north and east by open areas; on the south by lodgepole stands and on the west by treated areas on the Long-Bell tract.

Torrent Spring. Area 42 sections. The 1925 infestation amounted to 6,150 trees. Comparatively well isolated on the east border by lodgepole and open areas; on the north by treated areas on the Long-Bell tract, and on the west by open areas and lodgepole. There is no adequate barrier on the south.

Yamsay. Area 46 sections. 1925 loss was 4,500 trees. This area is more isolated than any other area on the Reservation. This isolation is secured by open areas on the west and south and by the treated Long-Bell stands on the east and change of type on the north. It contains some exceptionally high grade stumpage.

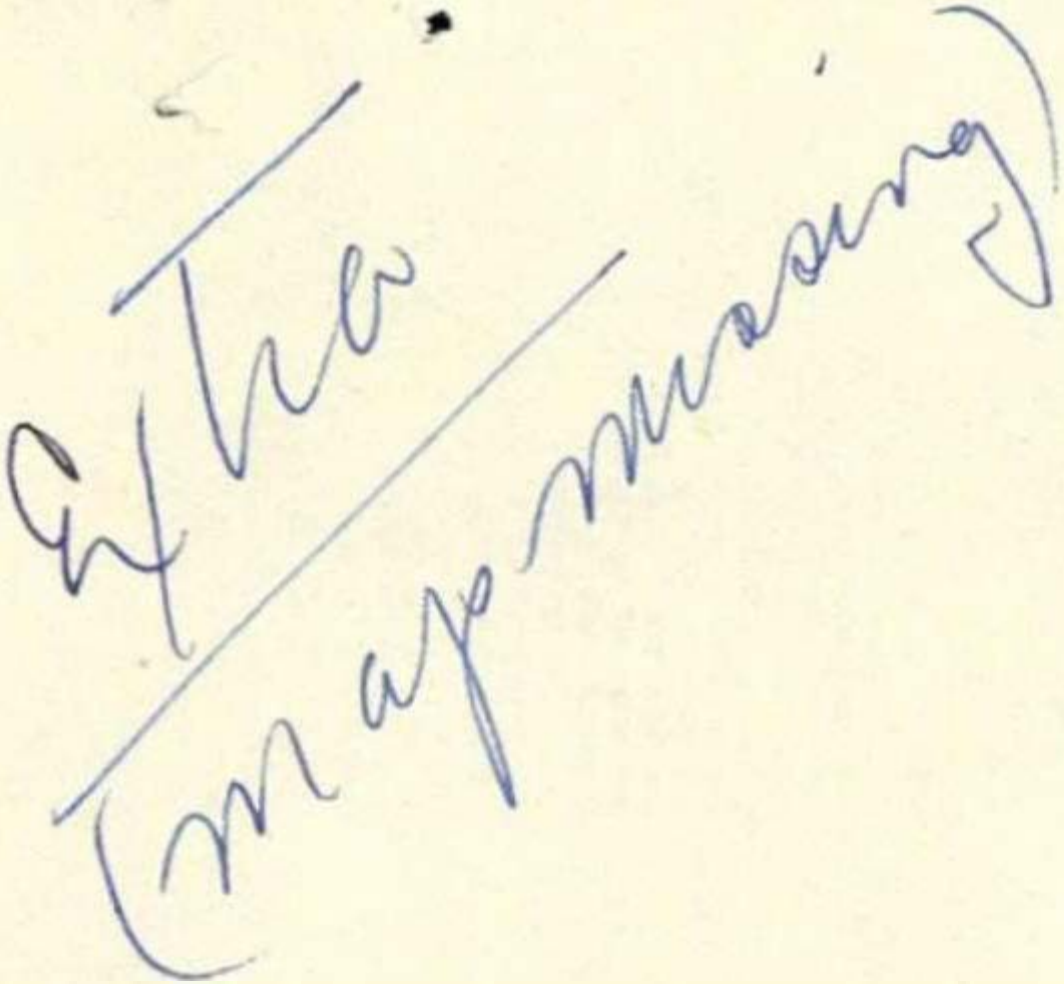
Wocus Bay. Area 95 sections. The 1925 beetle loss amounted to 11,650 trees. The isolation is fairly complete and consists of the Klamath Marsh on the north and west, very lightly infested stands on the south and open areas and the worked Long-Bell tract on the east. Probably the greatest amount of the Reservation's best stumpage is in this unit.

Applegate. Area 25 sections. 1925 loss was 2,150 trees. This area is small and well isolated. It is bounded on the north by the Klamath Marsh, on the west by lodgepole and cut over areas and on the east by the Wocus Bay unit. There is no barrier on the south other than a low ridge.

Respectfully submitted,

Ashland, Oregon.
September 14, 1926.

J.E. Patterson,
Assistant Entomologist.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